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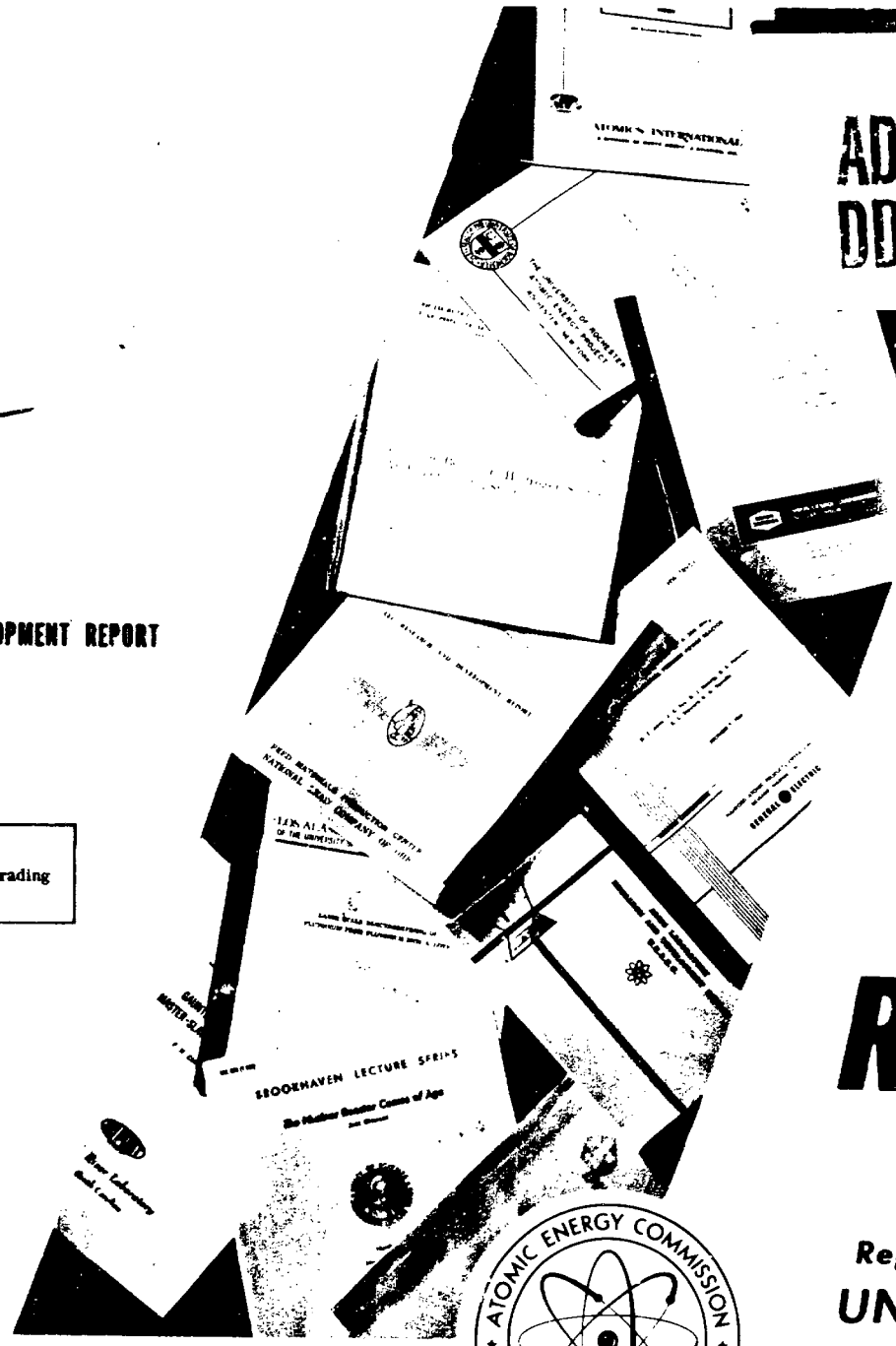

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U.S.S. LST 52

TEST ABLE

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(6)

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DIRECTOR OF SHIP MATERIAL

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USS LST 52

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USS LST 52

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ATOMIC ENERGY ACT 1946

U.S.S. LST 52

SHIP CHARACTERISTICS

Building Yard: Dravo Corp.; Neville Island, Penna.

Commissioned: 27 November 1943

HULL

Length Overall: 328 feet 0 inches.
Length on Waterline: 316 feet 0 inches.
Beam (extreme): 50 feet 0 inches.
Drafts at time of test: Fwd. 5 feet 3 inches.
Aft. 11 feet 3 inches.
Limiting displacement: 4,080 tons.
Displacement at time of test: 2,915 tons.

MAIN PROPULSION PLANT

Main Engines: Two General Motors Diesels, type: 12 - 567 A. One per main shaft.
Reduction Gears: "Falk" - Single reduction. One per engine.
Propellers: Two are installed in ship.
Main Shafts: Two are installed in ship.
Ships Service Generators: Three - 100 KW. - 230 volt, D.C. units are installed.

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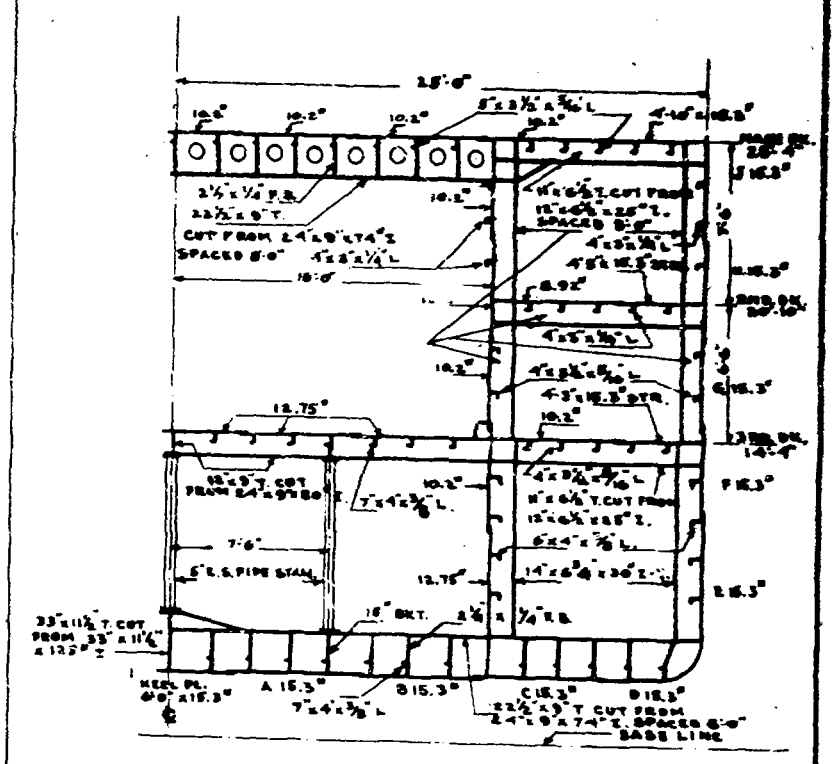


MIDSHIP SECTION

TEST A

(a) Drafts after test; list; general areas of flooding, sources.

There was no flooding, hence no change in drafts or list.

(b) Structural damage.

HULL

The elevator is badly distorted as the result of air blast and can not be operated. There is minor dishing of the shell plating and deck house bulkhead on the starboard side.

MACHINERY

Blast pressure tore one of the cables away from the elevator platform. This makes the elevator inoperable, although its machinery is undamage.

ELECTRICAL

No damage to electrical equipment occurred due to structural damage.

(c) Other damage.

HULL

Not observed

MACHINERY

There was no damage to machinery of this vessel during test A.

[illegible] occurred.

[illegible] occurred.

[illegible] lights were inoperable.

[illegible]

(c) Heat.

HULL

Heat started one fire and scorched a canvas awning on the port quarter and paint on vertical surfaces normal to the burst.

MACHINERY

No evidence.

ELECTRICAL

No electrical damage due to heat was noted.

(b) Fires and explosions.

HULL

The only fire burned a bag of 105 mm powder. There were no explosions.

MACHINERY

No evidence

ELECTRICAL

No electrical damage due to fire or explosions occurred.

(c) Shock.

HULL

Several light bulbs were broken. A porcelain wash basin was shaken from the bulkhead.

MACHINERY

No evidence.

ELECTRICAL

Shock caused a small number of filaments in light bulbs to break and caused pulling out of screw holding a light fixture in the wardroom.

(d) Pressure.

HULL

Air pressure caused deflection of the starboard bulkhead of the deck house and the starboard shell plating. Light topside equipment is damaged. The elevator platform was pushed down from the main deck securing devices.

MACHINERY

Blast pressure tore loose one of the cables of the tank deck elevator and broke loose heavy scale in the evaporators and some of the piping.

ELECTRICAL

Pressure or blast caused the starboard running light to be blown overboard and the range light to be blown down. Also caused cracked glasses on the 12" searchlights, port and starboard.

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

Blast pressure sufficient to have any noticeable effect at this distance from an explosion is apparently peculiar to the Atom Bomb.

ELECTRICAL

Radio activation was the only peculiar action noted to the atomic bomb.

III. Results of test on target.

(a) Effect on machinery, electrical, and ship control.

HULL

Not observed.

MACHINERY

None. The tank deck elevator is inoperable because of the breaking of one of its hoisting cables, but the machinery is undamaged. It is estimated that this condition could be remedied by the ship's force within 4 hours.

ELECTRICAL

No effect was noted due to electrical damage.

(b) Effect on gunnery and fire control.

HULL

Not observed

MACHINERY

No comment.

ELECTRICAL

No effect occurred due to electrical damage.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

No effect occurred due to electrical damage.

(d) Effect on personnel and habitability.

HULL

Personnel would have been affected by heat, blast, and radioactivity. Habitability is not affected.

MACHINERY

Personnel below decks would not have been affected by test A. Habitability was not affected.

ELECTRICAL

No effect occurred due to electrical damage.

(e) Effect on fighting efficiency.

HULL

Fighting efficiency is decreased by failure of the elevator which would prevent the landing of equipment stowed on the main deck.

[illegible] directly inoper-
[illegible] by the ship's
[illegible] navigating
[illegible] as machinery is concerned.

ELECTRICAL

No effect occurred due to electrical damage.

IV. Summary of Observers' Impressions and Conclusions.

HULL

This vessel, except for the elevator, behaved in a very satisfactory manner.

MACHINERY

LST 52 was outside the range of serious damage from the explosion during test A.

ELECTRICAL

At the distance of this vessel from the center of the blast, the effects of the bomb are very slight on electrical equipment. Such effects as were observed can be easily neutralized by changes in design or arrangement.

V. Preliminary recommendations.

HULL

Study should be given to the design of all types of elevators. These behaved poorly during the test.

MACHINERY

None.

ELECTRICAL

It is suggested the running lights be set in and streamlined to the superstructure as protection from the blast.

[illegible]

I. [illegible]

(a) Drafts after test, list, [illegible]

There was no [illegible] drafts or list.

(b) Structural damage. [illegible]

The elevator is [illegible] blast and can not be operated. There is minor damage of the [illegible] ing and deck house bulkhead on the starboard side.

(c) Other damage.

Not observed.

II. Forces Evidenced and Effects Noted.

(a) Heat.

Heat started one fire and scorched a canvas awning on the port quarter and paint on vertical surfaces normal to the [illegible].

(b) Fires and explosions.

The only fire burned a bag of 105 mm powder. There were no explosions.

(c) Shock.

Several light bulbs were broken. A porcelain wash basin was shaken from the bulkhead.

[illegible] of the starboard [illegible] shell plating. Light [illegible] was pushed [illegible].

(a) Effects apparently peculiar to the atom bomb.

None.

III. Effects of Damage.

(a) Effect on machinery, electrical and ship control.

Not observed.

(b) Effect on gunnery and fire control.

Not observed.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

Personnel would have been affected by heat, blast, and radioactivity. Habitability is not affected.

(e) Effect on fighting efficiency.

Fighting efficiency is decreased by failure of the elevator which would prevent the landing of equipment stowed on the main deck.

IV. [illegible]

This [illegible] very satisfactory manner.

V. Preliminary [illegible] Inspection Group [illegible]

Study should be given to the design of all [illegible] of elevators. These behaved poorly during the [illegible]

VI. Instructions for loading the vessel [illegible] the following:

ITEM	LOADING
Fuel Oil	Min.
Diesel Oil	Min.
Ammunition	10%
Potable and reserve feed water	No restriction
Salt water ballast	1210

Details of the actual quantities of the various items aboard are included in Report 7, Stability Inspection Report, submitted by the ship's force in accordance with "Instructions to Target vessels for Tests and Observations by Ship's Force," issued by the Director of Ships Material. This report is available for inspection in the Bureau of Ships Crossroads Files.

[illegible]

A. General Description of Hull Damage.

The elevator is badly damaged and cannot be operated. The starboard shell and starboard bulkhead of the deckhouse are somewhat dished. Miscellaneous equipment topside is damaged. General views of the exterior are shown on pages 31 to 34 , inclusive.

B. Superstructure.

The starboard bulkhead of the deckhouse, frames 30 to 50, is dished about 3/4 inch. Light topside equipment is somewhat damaged.

Both running light brackets are torn loose. The starboard running light is blown overboard. The range light is damaged beyond repair.

C. Turrets, Guns and Directors.

No damage.

D. Torpedo Mounts, Depth Charge Gear.

Not Applicable.

E. Weather Deck.

The after port hoisting cable of the elevator broke and the elevator retaining pins near this corner sheared. As a result the elevator platform sagged (Photos 1664-3, 2047-2, pages 35 ,and 36). The beams supporting the elevator platform are bent and torn (Photos 2047-4, 5, pages 37 , and [illegible]). The platform plating has come loose from the supporting structure (Photo 2047-3, page 39).

Specially installed strongbacks were installed on the cargo hatch cover. These prevented movement of the hatch boards. However, one of the strong backs inadvertently was not installed with the result that the hatch boards in this section were displaced.

A bag of [illegible] powder exhibited at the [illegible] board, burned.

F. Exterior Hull.

There is slight dishing of the [illegible] frames 30 to 40.

G. Interior Compartments (above w.l.).

A wash basin was [illegible] the starboard bulkhead of the deck house. There is no other damage.

H. Armor Decks and Miscellaneous Armor.

Not Applicable.

I. Interior Compartments (below w.l.).

No damage.

J. Underwater Hull.

No damage.

K. Tanks.

No damage.

L. Flooding.

None.

M. Ventilation.

No damage.

N. Ship Control.

No damage.

O. Fire Control.

No damage.

P. Ammunition Behavior.

No damage.

Q. Ammunition Handling.

No damage.

R. Strength.

No damage.

S. Miscellaneous.

No comment.

[illegible]

[illegible]

I. Target Condition After Test.

(a) Drafts after test, [illegible]

No data taken by [illegible]

(b) Structural damage.

Blast pressure tore one of the [illegible] the elevator platform. This makes the elevator [illegible] its machinery is undamaged.

(c) Other damage.

There was no damage to machinery of the [illegible] during Test A.

II. Forces Evidenced and Effects Noted.

(a) Heat.

No evidence.

(b) Fires and explosions.

No evidence.

(c) Shock.

No evidence.

(d) Pressure.

Blast pressure tore loose one of the cables of the tank deck elevator and broke loose heavy scale in the [illegible] and some of the piping.

[illegible] to the atom bomb.

[illegible] to have any noticeable [illegible] peculiar to [illegible]

III. Effects of Damage.

(a) Effect on machinery and ship control.

None. The tank deck elevator is inoperable because of the breaking of one of its hoisting cables but the [illegible] chinery is undamaged. It is estimated that this condition could be remedied by the ship's force within 4 hours.

(b) Effect on gunnery and fire control.

No comment.

(c) Effect on water-tight integrity and stability.

No comment.

(d) Effect on personnel and habitability.

Personnel below decks would not have been affected by Test A. Habitability was not affected.

(e) Total effect on fighting efficiency.

The tank deck elevator was made temporarily inoperable. It is estimated that it could be made operable by the ship's force within 4 hours. The test had no other effect on fighting efficiency as far as machinery is concerned.

IV. General Summary.

LST-52 was outside the range of serious damage

[illegible] Test A.

V. Preliminary Recommendations.

None.

DETAILED DESCRIPTION OF MACHINERY DAMAGE

A. General Description of Machinery Damage.

(a) Overall condition.

The overall condition of the machinery was not changed by Test A.

(b) Areas of major damage.

None.

(c) Primary cause of damage in each area of major damage.

Not Applicable.

(d) Effect of target test on overall operation of machinery plant.

The target test had no effect on the overall operation of the machinery plant. All machinery has been operated since the test.

B. Boilers.

The heating boiler and its appurtenances were not damaged by Test A.

C. Blowers.

Included with "B" - boilers.

D. Fuel Oil Equipment.

Included with "B" - boilers.

E. Boiler Feedwater Equipment.

Included with "B" - boilers.

F. Main Propulsion Machinery.

Undamaged. Both engines were operated under power for 30 to 40 minutes after Test A. Performance was normal.

G. Reduction Gears.

Undamaged. The reduction gears were checked while the ship was underway. Performance was normal.

H. Shafting and Bearings.

Undamaged. The shafting and bearings were checked while the ship was underway. Performance was normal.

I. Lubrication System.

Undamaged. The system was checked while the ship was underway.

J. Condensers and Air Ejectors.

Not Applicable.

K. Pumps.

No damage was sustained. All pumps have been in normal operation since the test.

L. Auxiliary Generators (Turbines and Gears).

Not Applicable.

M. Propellers.

Undamaged. Examination from the surface of the water shows no evidence of damage. No abnormal condition was indicated when the ship shifted berths under her own power.

N. Distilling Plant.

Undamaged. The evaporators were heavily scaled before the test. Scale was jarred loose by the blast.

O. Refrigeration Plant.

Undamaged. The refrigeration plant was placed in operation immediately after the test and functioned normally.

P. Winches, Windlasses, and Capstans.

Undamaged. All deck machinery has been tested under load.

Q. Steering Engine.

Undamaged. The steering engine was operated while the ship was underway and functioned normally.

R. Elevators, Ammunition Hoists, etc.

The machinery of tank deck elevator is apparently undamaged. The elevator is damaged structurally preventing operation. The port after cable tore loose from the elevator platform. Boat davits and gear are intact.

S. Ventilation (Machinery).

Undamaged. All ventilation machinery has been operated since the test. There is some minor damage to casings of ventilation sets, which does not impair operation.

T. Compressed Air Plant.

Undamaged. The air compressors were [illegible] after Test A and functioned normally.

U. Diesels. (Generators and Boats).

Undamaged. All generators were operated under load after the test and functioned normally.

No boats were aboard during the test.

V. Piping Systems.

Undamaged. Some of the piping had heavy corrosion before the test and some scale was jarred loose by the blast. After cleaning, all piping was tested under normal operating pressure and was satisfactory.

W. Miscellaneous.

Undamaged.

[illegible] DAMAGE

[illegible] After Test.

(a) Depth after test; list; general areas of flooding, sources.

No flooding noted in the way of electrical equipment.

(b) Structural damage.

No damage to electrical equipment occurred due to structural damage.

(c) Other damage.

No electrical damage to machinery occurred.

No electrical damage to ship control occurred other than that the starboard running and range lights were inoperable.

II. Forces Evidenced and Effects Noted.

(a) Heat.

No electrical damage due to heat was noted.

(b) Fires and explosions.

No electrical damage due to fires or explosions occurred.

(c) Shock.

Shock caused a small number of filaments in light bulbs to break and caused pulling out of screw holding a light fixture in the ward-room.

[illegible] starboard running [illegible] to be torn down.
[illegible] 12" [illegible] light, port and starboard.

(c) Any effects apparently peculiar to the atom bomb.

Radio activation was the only peculiar action noted to the atom bomb.

III. Effects of Damage.

(a) Effect on propulsion and ship control.

No effect was noted due to electrical damage.

(b) Effect on gunnery and fire control.

No effect occurred due to electrical damage.

(c) Effect on water-tight integrity and stability.

No effect occurred due to electrical damage.

(d) Effect on personnel and habitability.

No effect occurred due to electrical damage.

(e) Total effect on fighting efficiency.

No effect occurred due to electrical damage.

IV. General Summary of Observers' Impressions and Conclusions.

At the distance of this vessel from the center of the blast, the effects of the bomb are very slight on electrical equipment. Such affects as were observed can be easily neutralized by changes in desigh or arrangement.

V. Any Preliminary General or Specific Recommendations of the Inspecting Group.

It is suggested the running lights be set in and streamlined to the superstructure as protection from the blast.

[illegible] is the same as

(b) Areas of major damage.

No major damage occurred except the starboard running light and range light carried away.

(c) Primary causes of damage in each area of major damage.

The cause of all electrical damage is the blast.

(d) Effect of target test on overall operation of electric plant.

None.

(e) Types of equipment most affected.

Running and range lights.

B. Electric Propulsion Rotating Equipment.

Not Applicable.

C. Electric Propulsion Control Equipment.

Not Applicable.

D. Generators - Ships Service.

No damage.

E. Generators - Emergency.

Not Applicable.

F. Switchboards, Distribution and Transfer Panels.

No damage.

G. Wiring, Wiring Equipment and Wireways.

No damage.

H. Transformers.

Not Applicable.

I. Submarine Propelling Batteries.

Not Applicable.

J. Portable Batteries.

No damage.

K. Motors, Motor Generator Sets and Motor Controllers.

No damage.

L. Lighting Equipment.

No damage occurred except as follows:

The starboard running light and range light carried away due to blast.

M. Searchlights.

No damage.

N. Degaussing Equipment.

No damage.

[illegible]

[illegible]

No damage.

[illegible] Powered Telephones.

No damage.

Q. Ship's Service Telephones.

Not Applicable.

R. Announcing Systems.

Not Applicable.

S. Telegraphs.

No damage.

T. Indicating Systems.

No damage.

U. LC. and A.C.O. Switchboards.

Not Applicable.

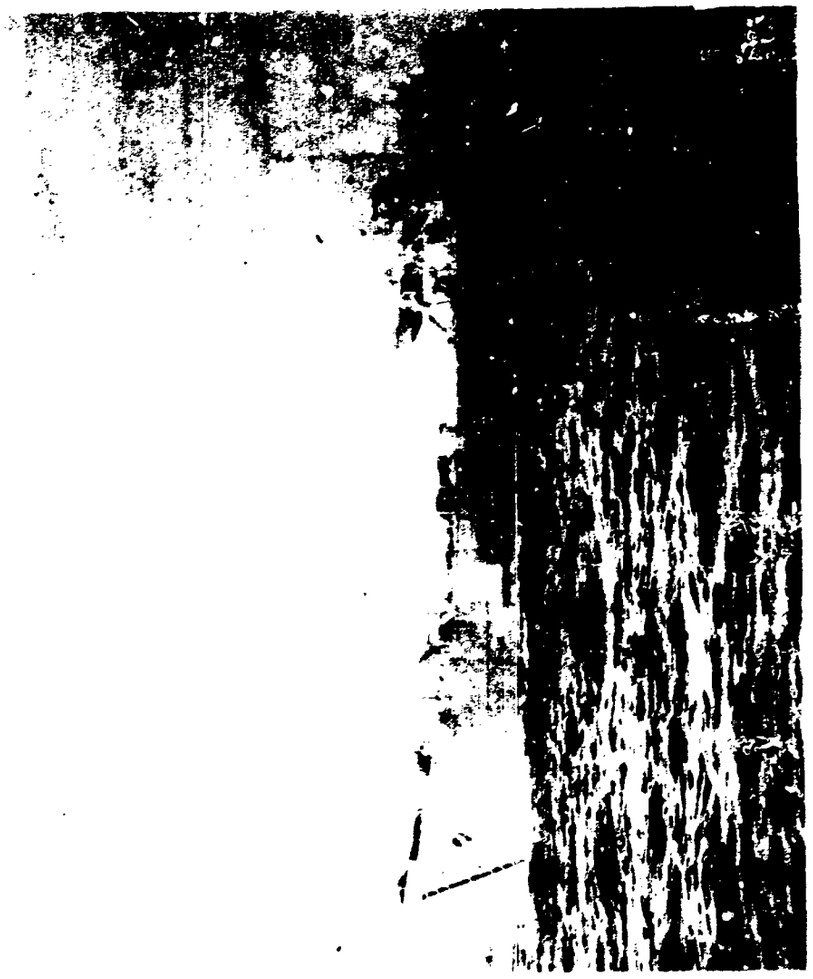
V. F. C. Switchboard.

Not Applicable.

SECTION IV

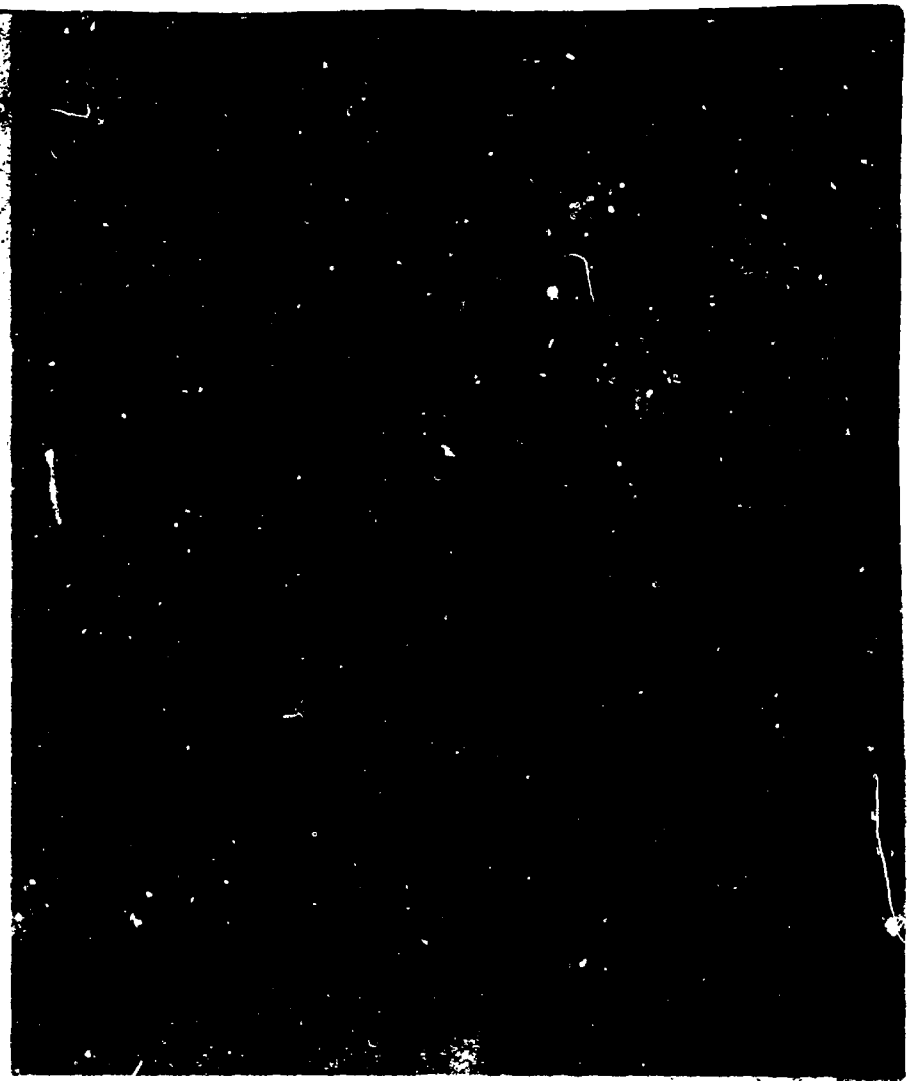
PHOTOGRAPHS

TEST ABLE



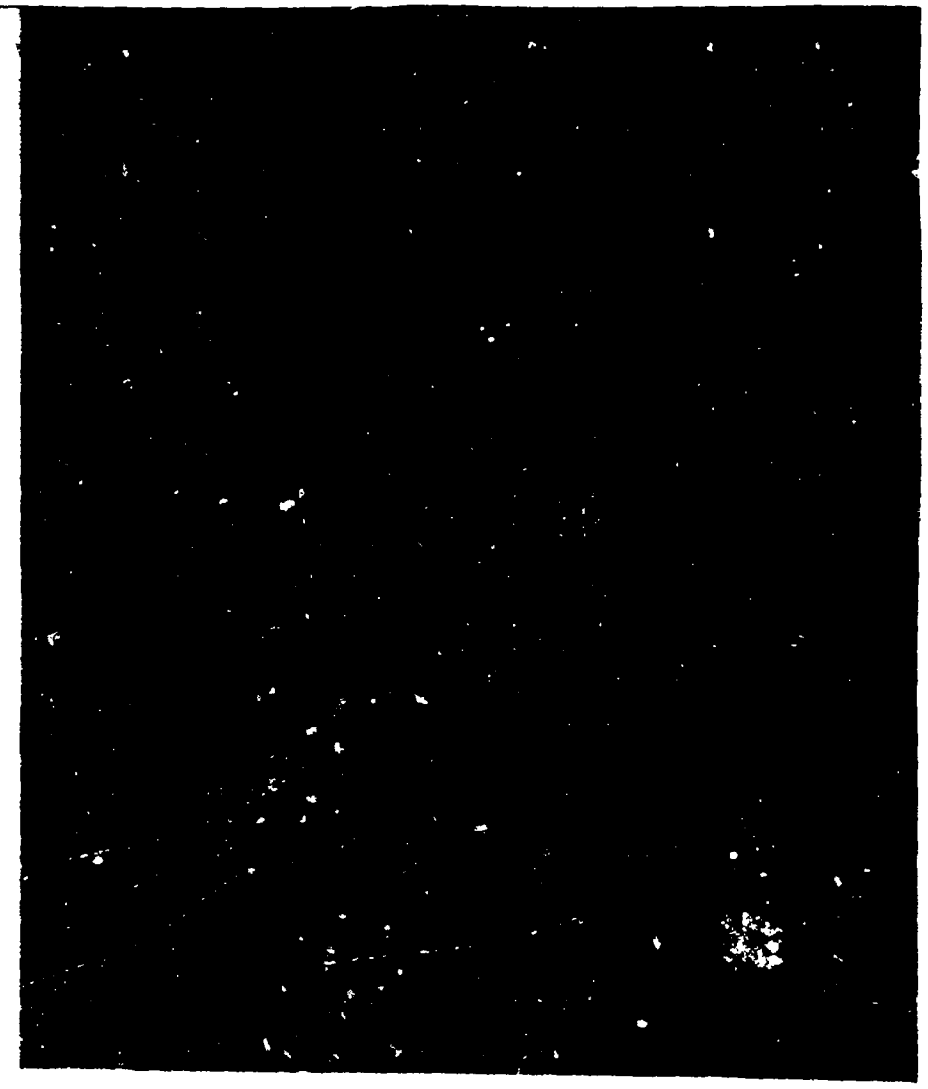
BA-CR-196-164-28. View from off port bow before Test A.

AA-CR-227-50-25. View from off port bow after Test A.

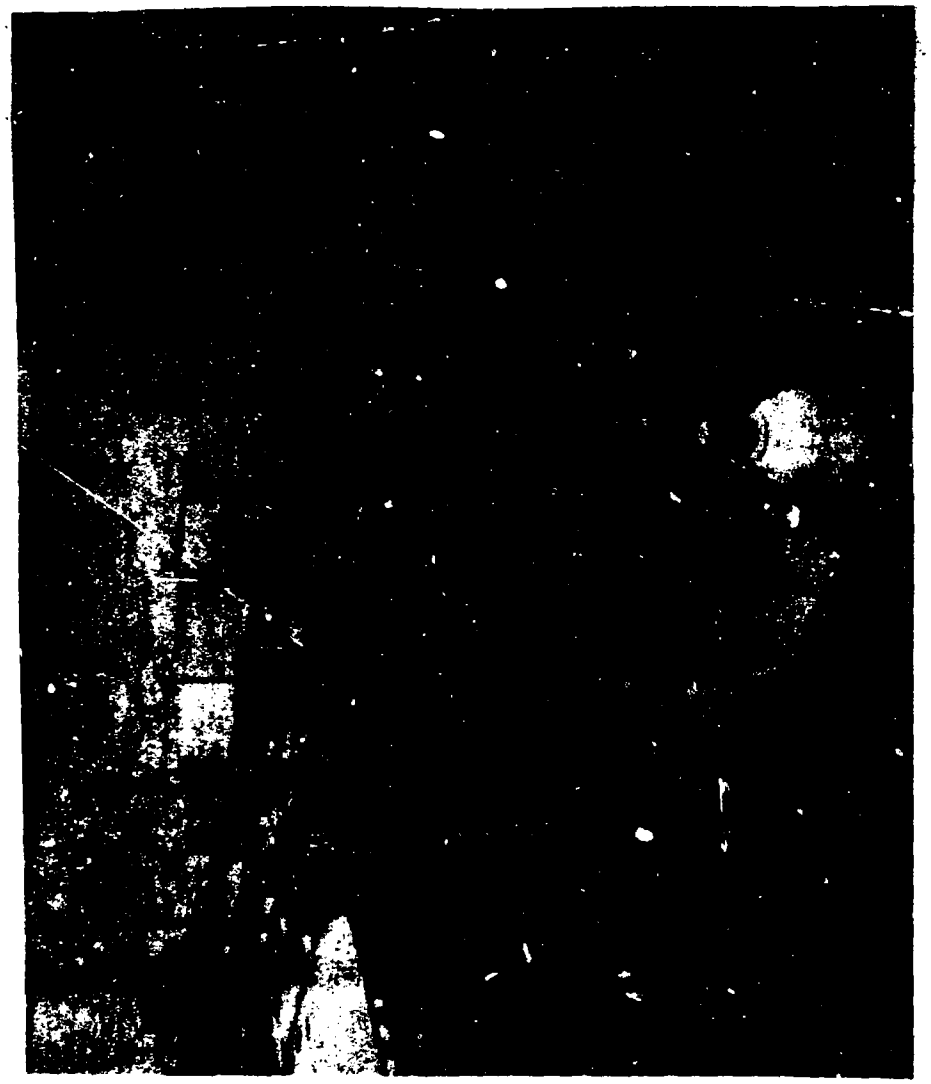


BA-CR-196-164-31. View from off starboard beam before Test A.

AA-CR-227-91-10. View from off starboard beam after Test A.

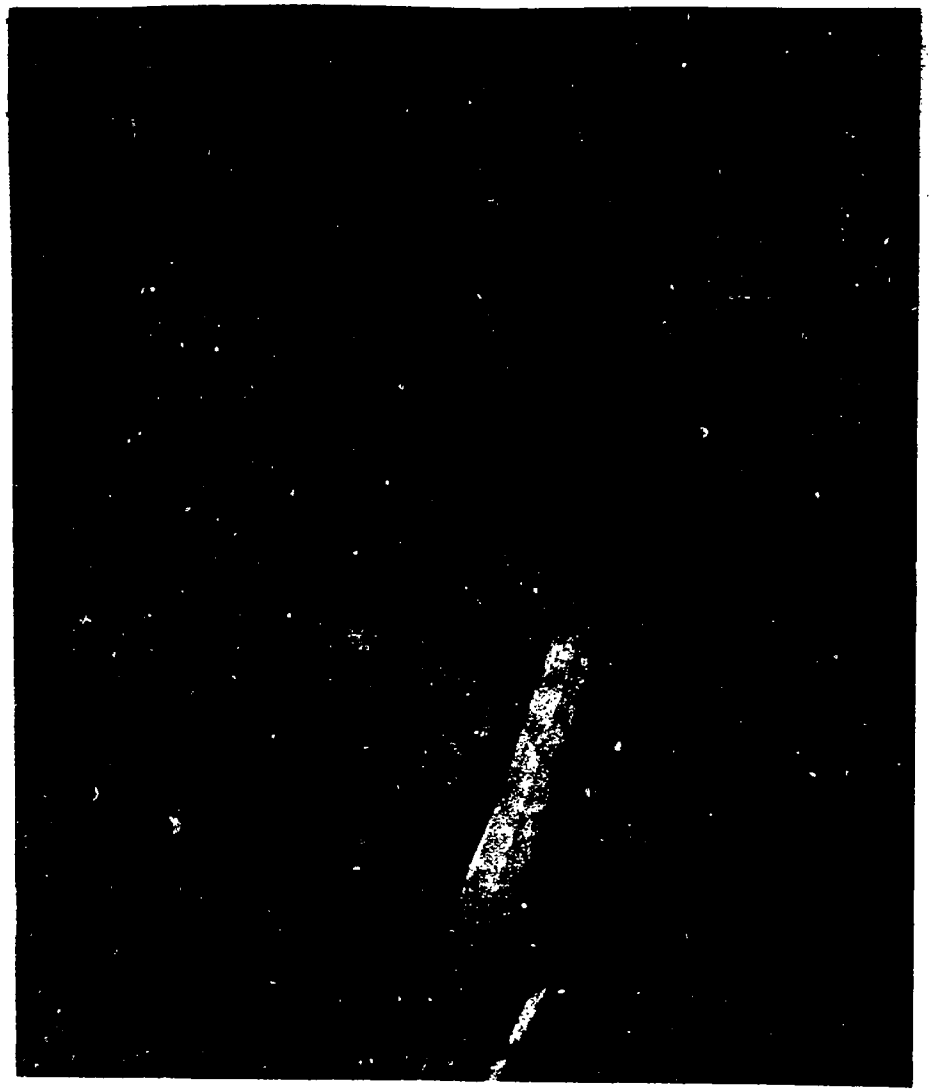


AA-CR-81-1664-3. Looking aft at damaged elevator platform.

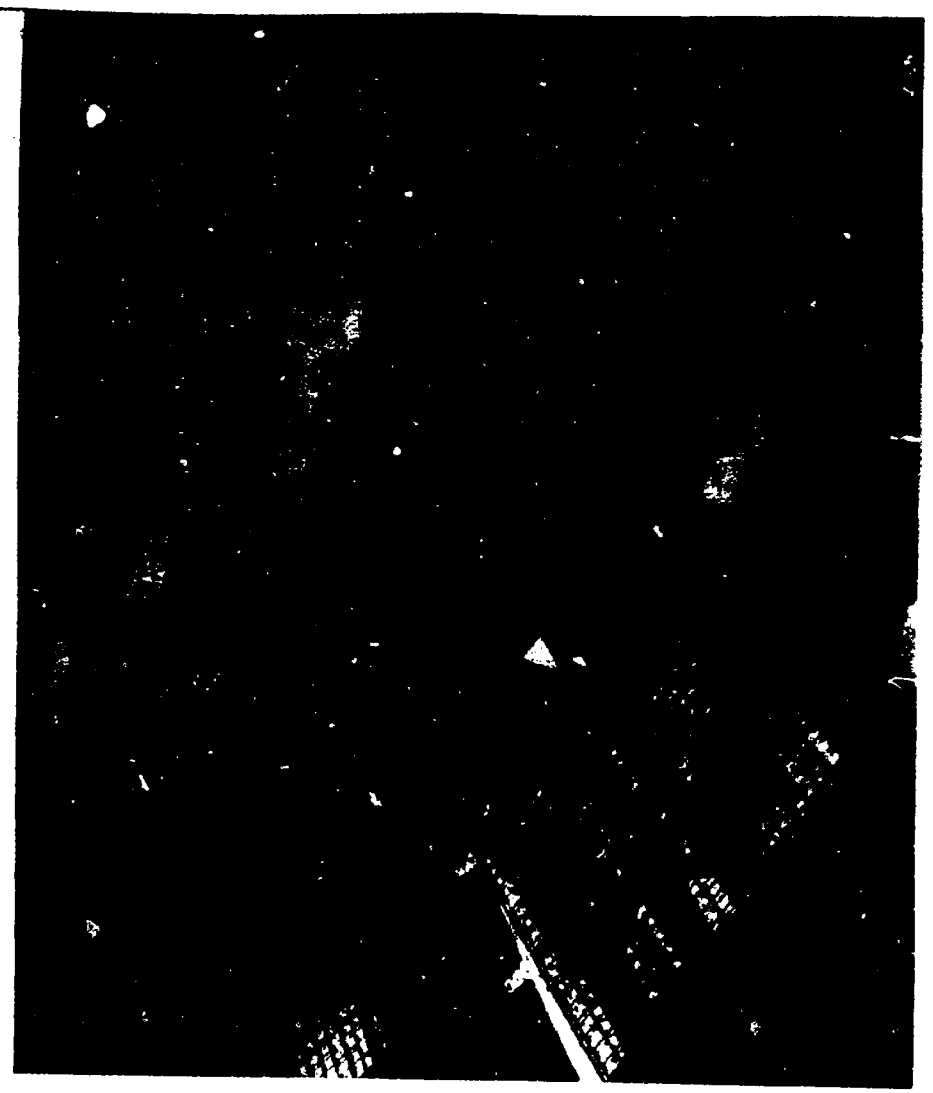


AA-CR-66-2047-2. Damage to elevator platform.

AA-CR-66-2047-4. Damage to elevator platform.



AA-CR-66-2047-5. Damage to elevator platform.



AA-CR-66-2047-3. Displaced platform plating on elevator.

APPENDIX

COMMANDING OFFICERS REPORT

TEST ABLE

REPORT # 11

COMMANDING OFFICERS REPORT

SECTION I

LST 52, class of LST's 1 to 490, anchored in berth 108 in 21 fathoms of water, bearing 186° true from the U.S.S. NEVADA, (BB36), distance 1500 yards.

The material condition of the ship at the time of the test was in very good condition, all water tight doors, Latches, closures and fittings were in an operating condition. All compartments, machinery spaces, holds, storerooms, voids, tanks and cofferdams were water-tight as far as the ship's force could determine without applying an air test.

All equipment was in a satisfactory condition, exclusive of the public announcing system.

There was no gasoline or kerosene aboard. All fuel oil was in A-418-F. There was six cylinders of acetylene gas and oxygen in brackets on main deck at frame 36, starboard side, no other explosives or inflammables were on board except what army ordnance and army chemical warfare placed on board for experimental purposes.

SECTION II

Damage as the result of the test is that the hull plating from the water line to the main deck between the frames 20 and 40 were caved in from 1 to 3 inches between the frames, apparently caused by the blast. Superstructure bulkhead or deck house on starboard side was caved in from 1 to 3 inches between frames, from frames 30 to 50, apparently caused by blast. Port and starboard running light brackets were blasted loose being on main deck in a damaged condition, starboard running light was carried overboard by the blast. Range light was blasted loose from bracket and lying on boat deck beyond repair.

The elevator going from the tank deck to main deck forward was raised out of it's secured position evidently caused by a vacuum on the tank deck from the blast. This caused the after hoisting wires to jump out of their sheaves breaking the securing pads on the after port corner allowing the after end of the elevator to drop about three feet. This caused the thwartship beams to bend and tearing loose the plating from the beams which made the elevator beyond ship's force repair.

There were several light bulbs blown out and shattered in the officers country and on the second deck, due to the blast.

The ventilation duct in passageway between radio shack and chart room was bulged out, due to the blast.

Due to the small damage to this ship by the test, it is believed that the ship could of stayed in action. If the ship was on the beach unloading troops and vehicles it would of been impossible to move vehicles from the main deck to the tank decks for running to the beach, otherwise there was no apparent damage to take the ship out of action.

SECTION III

The effects of the target test on this ship, outside of all damages as mentioned in the foregoing there is evident that the ship listed or rolled excessively, due to desks, chairs and other articles being turned over. The army ammunition placed aboard especially for the test, there were only about six items which were ignited which were on the starboard side of the forecastle, these items never caused damage to the structural part of the ship. Other test material and items placed aboard remained undamaged.

There was no evidence of any fires breaking out in any part of the ship. No flooding of any nature occurred, upon reboarding the ship by team "Able" the drafts fore and aft, the trim and all soundings of voids and tanks were the same as it was when abandoned ship.

It is believed that any personnel that would of been aboard on the weather decks would of survived the test if they would of been on the leeside under cover or behind some sort of shielding away from the heat wave and the blast. All personnel below decks could have survived due to no radio activity being aboard according to geiger counters.

CAUTION

This Document Contains
ATOMIC WEAPONS INFORMATION

NOTICE

This document contains atomic weapons information. Distribution is limited to recipients authorized by the Defense Atomic Support Agency (DOD) and/or the Division of Military Application (AEC)

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Defense Special Weapons Agency
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TRC

10 April 1997

MEMORANDUM FOR DEFENSE TECHNICAL INFORMATION CENTER
ATTENTION: OMI/Mr. William Bush

SUBJECT: Declassification of Reports

The Defense Special Weapons Agency (formerly Defense Nuclear Agency) Security Office has reviewed and declassified the following reports:

AD-366718	XRD-32-Volume 3	
AD-366726	XRD-12-Volume 2	
AD-366703	XRD-16-Volume 1	
AD-366702	XRD-14-Volume 2	
AD-376819L	XRD-17-Volume 2	
AD-366704	XRD-18	
AD-367451	XRD-19-Volume 1	
AD-366705	XRD-20-Volume 2	AD-366705
AD-376028L	XRD-4	
AD-366694	XRD-1	
AD-473912	XRD-193	
AD-473891	XRD-171	
AD-473899	XRD-163	
AD-473887	XRD-166	ST-A 28 JAN 80
AD-473888	XRD-167	made target
AD-473889	XRD-168	

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SUBJECT: Declassification of Reports

AD-B197749	XRD-174
AD-473905	XRD-182
AD-366719	XRD-33 Volume 4
AD-366700	XRD-10
AD-366712	XRD-25 Volume 1
AD-376827L	XRD-75
AD-366756	XRD-73
AD-366757	XRD-74
AD-366755	XRD-72
AD-366754	XRD-71
AD-366710	XRD-23 Volume 1
AD-366711	XRD-24 Volume 2
AD-366753	XRD-70
AD-366749	XRD-66
AD-366701	XRD-11
AD-366745	XRD-62.

All of the cited reports are now **approved for public release; distribution statement "A" applies.**

Ardith Jarrett
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Chief, Technical Resource Center

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